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THE DEVELOPMENT OF PHYSICS OF THE ATMOSPHERE AND OF METEOROLOGY DURING THE FIRST DECADE OF THE POLISH PEOPLE'S REPUBLIC

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Reconstruction of Polish Meteorology, Developmental Trends, and Fields of Study

While World War I resulted in a considerable development of meteorology and the rise of the meteorological service in Poland, World War II caused an almost complete annihilation of the scientific facilities and the loss of a considerable part of scientific results. Many meteorologists were abroad at the time, e. g., Arctowski and Gorczynski in the United States of America, Smosarski in France, Guminski in Germany, Stenz in Afghanistan.

When the Polish People's Republic was established, the thinned ranks of Polish meteorologists were faced with the tremendous task of the complete reconstruction of the state meteorological service and of the meteorological facilities. As a result of the untiring effort of a whole staff of people, headed by their director J. Matuszewicz, the PIHM [Panstwowy Instytut Hydrologiczno-meteorologiczny -- State Hydrological and Meteorological Institute] was organized. It soon became the center for meteorological work in the country. At that time Gorczynski, Guminski, Smosarski, and Stenz returned from abroad, strengthening the thin ranks of the meteorologists of the older generation and taking part in the organisation of some laboratories within the institution of higher learning.

Soon these laboratories began to train new teams of meteorologists and geophysicists, so necessary for the reconstruction of the country; at the same time scientific work was launched. The first to do so was the Institute of Meteorology and Climatology of Bierut University in Breslau, under the direction of professor A. Kosiba. Gradually the meteorological laboratories in Poznan (professor Smosarski), Torun (professor Gorczynski), Warsaw (professor Guminski), and Lublin (doctor Zinkiewicz), as well as the Institute of Geophysics in Warsaw (professor Kopcewicz and professor Stenz), were organized. Unfortunately toward the end of the first decade, Polish meteorology suffered a great loss when professors R. Guminski (1952) and W. Gorczynski (1953) died.

The PIHM is a great organization; in addition to its practical work, it also engages in scientific research. Besides the PIHM headquarters, which carries out research in general meteorology, the following should be mentioned: the PIHM Aerological Observatory in Legionow, specialising in aerology and medium-range forecasts; the Oceanographical Institute in Gdynia; the PIHM division in Cracow (synoptics and climatology); the High Altitude Observatory in Kasprowy Wierch, and others.

The Institute of Meteorology and Climatology UBB [Uniwersytet imienia Boleslawa Bieruta -- Boleslaw Bierut University] in Breslau, organized a model meteorological observatory which gathers a large amount of data for Breslau. This institute studies the meteorological and climatological problems of Silesia in general and Breslau in particular. The institute of Meteorology and Climatology UMK [Uniwersytet Mikolaja Kopernika -- Nicolaus Copernicus University] in Torun specializes in research on solar radiation and solar absorption;

it also was a climatological cartography division. The Institute of Meteorology WSR in Poznan carries out investigations on optical phenomena in the atmosphere and atmospheric electricity; the Institute of Geophysics UW [Uniwersytet Warszawski -- Warsaw University] on the country's insolation. The Aerological Observatory in Legionow (professor T. Kopcewicz) and the PIHM headquarters in Warsaw are centers of theoretical work.

Achievements

Despite considerable war devastation, Polish meteorology was reborn like "a Phoenix from the ashes" and toward the end of the first postwar decade can point to great achievements.

The PIHM can boast of the greatest progress since during this period, it put out several monographs, including those entitled "On Air Temperatures," "Hail in Poland" (M. Molga), as well as several meteorological annuals. The institute puts out 3 publications containing results of its investigations. These are Wiadomosci Slusby Hydrologicznej i Meteorologicznej [News of the Hydrological and Meteorological Service], Prace PIHM [Works of PIHM], and the Rocznik [Annual]. The following authors have published some of the more important papers: K. Chomicz, R. Ouminski (several papers), M. Molga, and W. Wisniewski.

The greatest activity at the universities was shown by the Institute of Meteorology and Climatology UWB in Breslau. (Professor Kosiba published "The Climate of Silesia" and "The Snow Cover" while M. Polonska, Master of Science, wrote "The Climate of Racibarse" and "Rainfall in Breslau.") Copernicus University in Torun should be mentioned next; there Professor Gorczynski prepared studies in

the field of insolation and climatology and Professor W. Okolowicz in paleoclimatology. Professor W. Smosarski also published several papers in Poznan ("The Electricity of air," "The Optical Phenomena in the Atmosphere"). The following also deserve mention: publications of professor S. Piotrkowski (Astronomical Observatory in Cracow) on the illumination of the atmosphere; doctor L. Kolodziejczyk (the Scientific Organization of Lodz) on the ionosphere; doctor M. Mackiewiczowna on insolation in Poland; professor E. Stens (Institute of Geophysics UW) on the high eastern wind of Copernicus; and W. Parczewski, Master of Science (PIHM), on thermodynamic conditions of the lower levels of the atmosphere.

In mentioning publications in the field of meteorology and the physics of the atmosphere, one should not omit mention of text books published. At the top of this list are Fizyka atmosfery [The Physics of the Atmosphere] by professor T. Kopcewicz and Kurs Meteorologii i Klimatologii [Course in Meteorology and Climatology] by professor R. Guminski. Then there are, the manuscripts of professor W. Smosarski and professor A. Kosiba, Meteorolgia na uslugach lotnictwa [Meteorology in the Service of Aviation] by C. Szczeinski and Meteorologia na szybowcowa [Meteorology for Gliders] by W. Parczewski. There remains however a need for a good meteorology text book with a modern approach.

Generally speaking Polish publications in the field of meteorology number over 100 of which the majority are original scientific papers.

The development of meteorology in the Polish People's Democracy was helped to a certain extent by results achieved in the period between the wars. This is especially true of the meteorological monographs and of the papers of W. Gorczynski in the field of insolation which formed the basis for similar investigations in Poland after World War II.

The development of Polish thought in the fields of the physics of the atmosphere and meteorology was influenced to a certain extent by many Soviet papers, especially those of Kibela and Chromow in the field of theoretical and synoptic meteorology. The possession of its own scientific organizations permits Polish meteorology to exchange its publications with those of the USSR, the people's democracies, and others; this greatly stimulates Polish creativeness and contributes to the popularization of achievements of Polish meteorological science.

Parallel with scientific research popularization work has also been started. The basis of this action for popularization was Gazeta Obserwatora PIHM [The PIHM Observer Gazette], written mostly (as the title indicates) for observers of the State Meteorological Service. There are also several popular science publications, original as well as translations from the Russian, published mostly by Wiedza Powszechna [Popular Science]. Several pamphlets should also be mentioned; they include those of W. Parczewski (Tajniki przewidywania pogody [Mysteries of Weather Forecasting], Meteorologia lotnicza [Meteorology for Aviation], etc) as well as those of E. Stenz such as Ziemia [The Earth], Zjawiska optyczne w atmosferze [Optical Phenomena in the Atmosphere], etc.

This popularization activity has also been undertaken by the Polish Society of Meteorology and [illegible] which organized numerous talks.

Attempt to Achieve the best results

Marxist-Leninist ideology has found its expression in the materialistic treatment of meteorological phenomena. There has been an ever increasing effort to become familiar with the methodology of complex investigations, especially in the field of climatological studies.

The following have contributed to an important degree to the development in the field of atmospheric physics and meteorology. (1) The First Congress of Polish Science in 1951 at which the geophysics subsection conducted introductory organizational work based on the principles of dialectic materialism. (2) The creation of PAN [Polska Akademia Nauk -- Polish Academy of Sciences] in 1952 whose Geophysics Committee sponsored the field of meteorological investigations. The Geophysics Committee PAN also organized cooperative work with other committees, especially with the Geography Committee PAN, with the aim of mapping the climate of Poland.

The Geophysics Committee also began to publish Acta Geophysica Polonica, a new scientific periodical which publishes the results of the most important scientific papers also in the field of physics of the atmosphere and meteorology. Because of the needs of the national economy, the most important problems selected for investigations were those of long-term forecasting and the preparation of the balance sheet of solar energy in Poland (see Nauka Polska [Polish Science], Vol I, 1953).

The Geophysics Institute arose alongside PAN in 1952. This institute at present limits its activity to papers on lithospheric subjects. However in the nearest future it will undertake work in the field of physics of the atmosphere; at present it is engaged in investigations of electricity of the atmosphere at Swidro.

It should be also mentioned that beside the institutions of learning and the organizations of PAN, the Polish Society of Meteorology and Hydrology, which came into being in 1947, has also conducted some scientific work. Due to the efforts of the meteorological group of scientists, this society organized some provincial divisions and began to publish its own periodical Przeglad Meteorologiczny i Hydrologiczny. This periodical significantly contributed to the enlivening of the activity of the society and makes possible the publication of papers of many authors. The society also organized 2 meetings devoted to the discussion of certain problems: one in Warsaw in 1952, devoted to the question of drought, and a second one in Zakopane in 1953, devoted to the question of floods and their forecasting. Although these meetings were not on a high level, they aroused a great deal of interest and allowed the discussion of the main themes from many different points of view.

Of investigations undertaken under the aegis of this society, one should also mention limnoactinometric investigations on the transparency of solar rays in lakes (professor E. Stens) as well as investigations on snow fields in the Tatra Mountains (professor W. Milat).

Representatives of the Polish Meteorological Service represented Polish meteorology in the people's democracies as well as in the West (Prague, Budapest, Paris, Zuerich) while professor Gorczynski in an exchange program took part in the activities in the German Democratic Republic. Nevertheless the contacts of Polish meteorology with foreign countries are few and the absence of the Polish delegation at the Congress of the Geodetic and Geophysics Union in Brussels had a very negative influence on the development of Polish scientific work due to the limitation of problems under discussion and investigation to those with short-term and local interest. In view of the fact that Polish meteorology is many years behind world meteorology, this should never happen again. Polish meteorology should play an active part in investigations with a worldwide interest; a good opportunity for the initiation of this cooperative work will be the congress of the union in Rome in 1954 in which Polish geophysicists should participate.

The education of young cadres and conditions of further development

A qualitative and quantitative comparison of Poland's achievements with those of other countries shows that in spite of considerable efforts and undoubted progress, Polish meteorology and especially theoretical meteorology (physics of the atmosphere) are very far behind, since except for a group of 3-4 meteorologists headed by professor Kopcewicz, we do not have in Poland any theoretical meteorologists. Nevertheless the development of meteorology depends on a good theoretical framework. The cause of this unfortunate condition is the fact that between the wars no theoretical meteorologists were being trained.

Thus the schooling of new ranks of meteorologists is today a problem of primary importance. An important step forward was made in the Polish People's Democracy in 1949 when the chair of physics of the atmosphere was created in the group of chairs of geophysics UW whose task is the education of the physicists of the atmosphere with a higher training standard. The tasks of this chair would be accomplished if the number of students were greater than it is in reality. The recruitment of youth for the study of the physics of the atmosphere should be much greater; at the moment the direction of recruitment is definitely negative.

A further requirement for the development of physics of the atmosphere and of meteorology -- from a scientific as well as from a didactic point of view -- is the development of the existing chair and the creation of an adequate laboratory. This will take place within the next few years with the construction of a special building for the Geophysics Institute, which will also include the chair of the physics of meteorology. There also will be established a model meteorological observatory, equipped with the most modern measurement apparatus and observatory equipment. Only when a special building exists, devoted solely to this purpose and when a sufficient influx of youth studying the physics of the atmosphere and meteorology is ensured, can the development of this science be made secure.